

IN THE CLAIMS:

Claims 1, 6, 9 through 12, 29, 52, 59, 64, and 79 are amended herein. Please note that all claims currently pending and under consideration in the referenced application are shown below. Please enter these claims as proposed to be amended. This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) An evaporator for a heat transfer system, the evaporator comprising:
a heated wall having a heat-absorbing surface adjacent to a heat source;
a liquid barrier wall containing working fluid on an inner side of the liquid barrier wall, which
fluid flows only along the inner side of the liquid barrier wall;
a primary wick extending from a portion of the heated wall to a portion of the liquid barrier wall;
a vapor removal channel located at an interface between the primary wick and the heated wall
and formed in at least one of an inner surface of the heated wall and an outer surface of
the primary wick; and
a liquid flow channel located at an interface between the liquid barrier wall and the primary wick
and formed in at least one of an inner surface of the liquid barrier wall and the outer
surface of the primary wick.
2. (Previously presented) The evaporator of claim 1, further comprising additional vapor removal channels located at the interface between the primary wick and the heated wall.
3. (Previously presented) The evaporator of claim 1, further comprising additional liquid flow channels located at the interface between the liquid barrier wall and the primary wick.
- 4 and 5. (Canceled)

6. (Currently Amended) The evaporator of claim 1, wherein the vapor removal channel is formed in the inner surface of the heated wall.

7 (Previously presented) The evaporator of claim 6, wherein the vapor removal channel is electro-etched into the heated wall.

8. (Previously presented) The evaporator of claim 6, wherein the vapor removal channel is machined into the heated wall.

9. (Currently Amended) The evaporator of claim 1, wherein a first portion of the vapor removal channel is formed in the inner surface of the ~~by the~~ heated wall and ~~another a~~ second portion of the vapor removal channel is formed in the outer surface of ~~formed by the~~ primary wick.

10. (Currently Amended) The evaporator of claim 9, wherein the first portion of the vapor removal channel is electro-etched into the heated wall.

11. (Currently Amended) The evaporator of claim 9, wherein the first portion of the vapor removal channel is machined into the heated wall.

12. (Currently Amended) The evaporator of ~~claim 9,~~ claim 1, wherein the vapor removal channel ~~formed in a~~ is formed in the outer surface of the primary wick.

13 through 15. (Canceled)

16. (Previously presented) The evaporator of claim 1, wherein the liquid flow channel supplies the primary wick with liquid from a liquid inlet.

17. (Canceled)

18. (Previously presented) The evaporator of claim 1, further comprising:
additional vapor removal channels located at the interface between the primary wick and the
heated wall; and
additional liquid flow channels located between the liquid barrier wall and the primary wick;
wherein the number of vapor removal channels is higher than the number of liquid flow
channels.

19. (Withdrawn) The evaporator of claim 1, further comprising:
a secondary wick disposed between the liquid flow channel and the primary wick; and
a vapor vent channel at an interface between the secondary wick and the primary wick.

20. (Withdrawn) The evaporator of claim 19, wherein vapor bubbles formed within
the vapor vent channel are swept through the secondary wick and through the liquid flow
channel.

21. (Withdrawn) The evaporator of claim 19, wherein the vapor vent channel delivers
vapor that has vaporized within the primary wick at a location proximate to the interface between
the primary wick and the liquid barrier wall away from the primary wick.

22. (Withdrawn) The evaporator of claim 19, wherein the secondary wick is a mesh
screen.

23. (Withdrawn) The evaporator of claim 19, wherein the secondary wick is a slab
wick.

24. (Previously presented) The evaporator of claim 1, wherein the primary wick, the
heated wall, and the liquid barrier wall are annular and coaxial.

25. (Previously presented) The evaporator of claim 24, wherein the heated wall is disposed inside the primary wick, which is disposed inside the liquid barrier wall.

26. (Previously presented) The evaporator of claim 1, wherein the vapor removal channel is thermally segregated from the liquid flow channel.

27. (Previously presented) The evaporator of claim 1, wherein the liquid barrier wall comprises fins disposed on an outer surface of the liquid barrier wall that cool a liquid side of the evaporator.

28. (Previously presented) The evaporator of claim 1, wherein the liquid barrier wall is cooled by passing liquid across an outer surface of the liquid barrier wall.

29. (Withdrawn and Currently Amended) A heat transfer system comprising:
an evaporator including:
a heated wall having a heat-absorbing surface adjacent to a heat source;
a liquid barrier wall containing working fluid on an inner side of the liquid barrier wall,
which fluid flows only along the inner side of the liquid barrier wall;
a primary wick extending from a portion of the heated wall to a portion of the liquid
barrier wall;
a vapor removal channel located at an interface between the primary wick and the heated
wall and formed in at least one of an inner surface of the heated wall and an outer
surface of the primary wick, the vapor removal channel extending to a vapor
outlet; and
a liquid flow channel located at an interface between the liquid barrier wall and the
primary wick and formed in at least one of an inner surface of the liquid barrier
wall and the outer surface of the primary wick, the liquid flow channel receiving
liquid from a liquid inlet;
a condenser having a vapor inlet and a liquid outlet;
a vapor line providing fluid communication between the vapor outlet and the vapor inlet; and
a liquid return line providing fluid communication between the liquid outlet and the liquid inlet.

30. (Withdrawn) The heat transfer system of claim 29, wherein the liquid barrier wall
of the evaporator comprises heat exchange fins disposed on an outer surface of the liquid barrier
wall.

31. (Withdrawn) The heat transfer system of claim 29, further comprising a reservoir
in the liquid return line.

32. (Withdrawn) The heat transfer system of claim 31, wherein the evaporator further comprises:

a secondary wick disposed between the liquid flow channel and the primary wick; and
a vapor vent channel at an interface between the secondary wick and the primary wick.

33. (Withdrawn) The heat transfer system of claim 32, wherein vapor bubbles formed within the vapor vent channel are swept through the secondary wick, through the liquid flow channel, and into the reservoir.

34. (Withdrawn) The heat transfer system of claim 32, wherein the vapor vent channel delivers vapor that has vaporized within the primary wick at a location proximate to the interface between the primary wick and the liquid barrier wall away from the primary wick and into the reservoir.

35. (Withdrawn) The heat transfer system of claim 31, wherein vapor bubbles are vented into the reservoir from the evaporator.

36. (Withdrawn) The heat transfer system of claim 31, wherein the reservoir is cold biased.

37. (Withdrawn) The heat transfer system of claim 29, wherein the evaporator is planar.

38. (Withdrawn) The heat transfer system of claim 29, wherein the evaporator is annular such that the heated wall is inside the primary wick, which is inside the liquid barrier wall.

39. (Withdrawn) The heat transfer system of claim 29, wherein liquid returning into the evaporator from the condenser is subcooled by the condenser.

40. (Withdrawn) The heat transfer system of claim 39, wherein an amount of subcooling produced by the condenser balances heat leakage through the primary wick.
41. (Withdrawn) The heat transfer system of claim 39, further comprising a reservoir in the liquid return line.
42. (Withdrawn) The heat transfer system of claim 41, wherein subcooling maintains a thermal balance within the reservoir.
43. (Withdrawn) The heat transfer system of claim 41, wherein the liquid return line enters the evaporator through the reservoir.
44. (Withdrawn) The heat transfer system of claim 41, wherein the reservoir is formed adjacent the liquid barrier wall of the evaporator.
45. (Withdrawn) The heat transfer system of claim 41, wherein the reservoir is formed between the liquid barrier wall and the primary wick of the evaporator.
46. (Withdrawn) The heat transfer system of claim 41, wherein the reservoir is formed as a separate vessel that communicates with the liquid inlet of the evaporator.
47. (Withdrawn) The heat transfer system of claim 41, wherein the reservoir comprises fins disposed on an outer surface of the reservoir that cool the reservoir.
48. (Canceled)
49. (Withdrawn) The heat transfer system of claim 29, wherein the heated wall contacts a hot side of a Stirling cooling machine.

50. (Withdrawn) The heat transfer system of claim 29, wherein the liquid flow channel is fed with liquid from a reservoir located above the primary wick.

51. (Withdrawn) The heat transfer system of claim 50, wherein the liquid barrier wall is cold biased.

52. (Currently Amended) An evaporator for a heat transfer system, the evaporator comprising:
a heated wall having an annular shape and a heat-absorbing surface adjacent to a heat source;
a liquid barrier wall having an annular shape and being coaxial with the heated wall;
a primary wick extending from a portion of the heated wall to a portion of the liquid barrier wall
and being coaxial with the heated wall, wherein the heated wall is positioned within a portion of both the liquid barrier wall and the primary wick;
a vapor removal channel located at an interface between the primary wick and the heated wall;
and
a liquid flow channel located at an interface between the liquid barrier wall and the primary wick.

53. (Previously presented) The evaporator of claim 52, wherein the heated wall is inside the primary wick, which is inside the liquid barrier wall.

54. (Previously presented) The evaporator of claim 52, further comprising a subcooler adjacent the liquid barrier wall.

55. (Canceled)

56. (Canceled)

57. (Previously presented) The evaporator of claim 52, wherein the liquid flow channel supplies the primary wick with liquid from a liquid inlet.

58. (Canceled)

59. (Currently Amended) The evaporator of claim 52, wherein the vapor removal channel is formed in an inner surface of the heated wall.

60. (Previously presented) The evaporator of claim 52, wherein the vapor removal channel is formed in a portion of the primary wick and a portion of the heated wall.

61. (Canceled)

62. (Canceled)

63. (Withdrawn) The evaporator of claim 52, further comprising:
a secondary wick disposed between the liquid flow channel and the primary wick; and
a vapor vent channel at an interface between the secondary wick and the primary wick.

64. (Currently Amended) The evaporator of claim 52, wherein the vapor removal channel is formed in an outer surface of the primary wick.

65. (Previously presented) The evaporator of claim 52, wherein the liquid barrier wall comprises fins disposed on an outer surface of the liquid barrier wall that cool a liquid side of the evaporator.

66. through 78. (Canceled)

79. (Withdrawn and Currently Amended) A method of transferring heat using the evaporator of claim 1, the method comprising:
applying heat energy to ~~[[a]] the~~ heat-absorbing surface of ~~[[a]] the~~ heated wall;
flowing liquid through ~~[[a]] the~~ liquid flow channel ~~that is defined at an interface between a liquid barrier wall and a primary wick~~;
pumping the liquid from the liquid flow channel through the primary wick ~~extending from a portion of the liquid barrier wall to a portion of the heated wall~~; and
evaporating at least some of the liquid at ~~[[a]] the~~ vapor removal channel ~~defined at an interface between the primary wick and the heated wall~~.

80. (Withdrawn) The method of claim 79, further comprising delivering vapor formed in the primary wick proximate to the liquid flow channel through a vapor vent channel disposed at an interface between a secondary wick and the primary wick.

81. (Withdrawn) The method of claim 80, wherein delivering vapor formed in the primary wick proximate to the liquid flow channel comprises sweeping vapor bubbles formed within the vapor vent channel through the secondary wick and through the liquid flow channel.

82. (Withdrawn) The method of claim 80, wherein delivering vapor formed in the primary wick proximate to the liquid flow channel comprises delivering vapor that has vaporized within the primary wick at a location proximate to the interface between the primary wick and the liquid barrier wall away from the primary wick.

83. (Withdrawn) The method of claim 79, further comprising cooling the liquid within the liquid flow channel with fins disposed on an outer surface of the liquid barrier wall.

84. (Withdrawn) The method of claim 79, wherein pumping the liquid from the liquid flow channel through the primary wick comprises pumping the liquid from the liquid flow channel through the primary wick having an annular shape.

85. (Withdrawn) The method of claim 79, wherein pumping the liquid through the primary wick comprises supplying the primary wick with additional liquid to offset the liquid vaporized at the interface between the primary wick and the heated wall and the liquid vaporized at the liquid barrier wall.

86. (Canceled)